GAS JOURNAL, FEB. 27, 1946

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WHAT LIES AHEAD?

IT has been very encouraging for us during recent months to have had shown to us what various manufacturers of domestic gas equipment are doing to fulfil the present and coming demand for efficient appliances in the home. These appliances cover a very wide field of service, and include, of course, cooking, space heating and water heating. That for many obvious reasons individual manufacturers do not necessarily see eye to eye with each other is for the gas consumer—and, after all, it is upon the consumer that the Gas Industry and manufacturer of apparatus alike depend—bound to be helpful rather than unhealthy. During the war years great advances have been made in the production of constructional materials capable of withstanding the effects of corrosion from products of combustion, and such advances have been due in very large measure to the efforts of the manufacturers of domestic gas equipment, who through these war years placed their plant and their resources at the disposal of the Government in the national interest, though during this period thought, time, and money, though necessarily restricted, were expended on better designs to satisfy post-war requirements. It is unfortunate that public demand has not been met speedily since the termination of war, but we see ahead of us that satisfying curve of acceleration. Report upon report has been published during and since the war on the amenities of the home, and though the reports may have differed largely in substance, all point to one conclusion—that the field for domestic equipment which will ease the lot of the housewife is immense. Hence our optimism regarding the aspirations of those manufacturers of new gas equipment—whether such equipment in the sphere of water heating, for example, should be instantaneous, multi-point, storage, quick recovery storage, or any other combination.

What Lies Ahead? In this regard we cannot do better than call attention to the remarkable Paper which Dr. Harold Hartley, Vice-President of the Institution of Gas Engineers, gave to a joint meeting of the Scottish Junior Gas Associations this month, and which we have published in full in the "JOURNAL." We have no intention of entering into any great detail concerning the many points put forward by Dr. Hartley in this Paper, but we should like to underline one or two of his observations which appeal to us as affecting the future of the Gas Industry and its personnel. Here is one pertinent observation: "Gas appliance designers must not be compelled to work on restricted lines; development in the future may involve the use of electrical and/or mechanical equipment with the object of improving performance to an extent not yet envisaged." The word "compel" interests us. Who is compelling, and who in the past have compelled, gas appliance designers to work on restricted lines? Has the gas engineer at Middleton-on-the-Mush done so, or has it been the command of the gas engineer in the capital city? In any case, surely the gas engineer has to make certain as far as lies within his power of ensuring continuity of gas supply for the various appliances which the manufacturers put before the consuming public. That there is desirability for far more co-operation and understanding between these two sides of the Industry goes without saying.

In his Paper Dr. Hartley discussed the cooking, water heating, and space-heating loads, setting out his views on their possible development in the light of new knowledge, and in the light, too, of possible keener competition from other sources of energy. His views in regard to the design of burners for the hotplate of a gas cooker, in particular his adverse comments on the incorporation of a high speed boiling burner, may not be shared by all. But everybody will agree with his general statement that the aim of the manufacturer should be to produce appliances which reduce trouble in use by the consumer, and at the same time minimize maintenance costs incurred by the gas undertakings which install them. There is, of course, a corollary to this: that the supplier of gas must play his part in supplying gas suitable for combustion, and gas as at present supplied in many areas, with its high sulphur content, is to this extent a disgrace, or at any rate an admission of failure. The Heyworth Committee recommended that the 10 grain maximum suggested by the Institution of Gas Engineers some years ago should be made obligatory. So far as it goes, this recommendation is good, but it does not go far enough. It is surely not beyond the wit of gas engineers to supply gas of a very much lower sulphur content than 10 grains per 100 cu.ft. The "neat" gas flame came within the purview of Dr. Hartley's comments on space heating. Gas fires using such flames are silent in operation, but they have very many advantages other than silence, which advantages were, in our opinion, insufficiently stressed by the Author—and, of course, "neat" gas flames are by no means solely suitable for embodiment in gas fires. We have had much to say on this matter during recent months and will not at the moment press the question further, though our convictions are very strong indeed on this question. Reverting to space heating, however, it is undoubtedly desirable that we should have more precise knowledge as to comfort requirements, and there can be little doubt that more information is needed on the question of the ratio between the amount of radiant and convected heat necessary for comfort.

Finally, we would stress the inspirational passages in the concluding portions of Dr. Hartley's Paper, and his comments on research work generally and research on combustion in particular. In this respect we make no apology for quoting liberally from the Paper. "Whatever the value of the researches which have been published in the last 40 years from the point of view of combustion theory, they have not been outstandingly helpful to the technician who is concerned with the application of the combustion processes in the domestic field. When comparison is made with the enormous amount of new knowledge which has been unearthed by the physicist in the same period, it is not unreasonable to suggest there is great need for scientific advance in the combustion field. In the 80's the physicist was concerned principally with molecular phenomena, but in the intervening period he has probed the structure of the atom and has effected a complete revolution in scientific thought. Modern combustion research does not appear to be keeping pace with these developments. . . . If the combustion process can be effected so as to cause greater changes in the 'energy levels' of the electrons in their orbits, or to induce a complete change in a small portion of the product by nuclear disturbance, an important step forward would be made. Published combustion researches do not seem to provide an inkling of the possibilities of such changes, but it may be the physicist will yet point the way." And again: "Concentration on *ad hoc* research is not sufficient. There is much to be learned from *ad hoc* investigation, but we are in the midst of a revolution, and thought must be given to the need for re-casting the whole structure of the scientific work on which our development depends."

We must not become pedestrian. Dr. Hartley's Paper should act as an incentive to imaginative endeavour.

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GAS LIGHT AND COKE

ALWAYS an event in the Gas Industry calendar, the annual meeting of the Gas Light and Coke Company this year was held in circumstances that made it of more than normal interest. There may be no significance in being first in the field, but it was in fact the first of the big London gas company meetings this year. It was also the first since the end of hostilities, the first under the Governorship of Mr. A. E. Sylvester, who was unfortunately prevented by illness from presiding, and the first since the Government had declared its nationalization intentions—and maybe one of the last if the undertaking should lose its identity in the shape of things to come. It would not have been surprising if in these circumstances stockholders had asked for more information than was contained in the report and accounts, or even in the informative speech with which they were presented. As Mr. Henry Woodall, the Deputy Governor, remarked, their unqualified acceptance was a tribute to the conduct of the Company's affairs during a most trying period.

How trying that period has been was shown in the Governor's speech, in which he recalled that the Company passed its dividends for the December half-year, 1940, and the year 1941. For 1944, for the first time since 1938, the Company succeeded in paying the basic dividend of 5% on the Ordinary stock, and this was maintained in 1945 with a carry-forward of £896,258, compared with £53,598 at the end of 1938. This carry-forward has been built up almost entirely since the population of London returned. In the last twelve months people have been coming back to London, and the consumption has steadily risen until it now stands at very nearly the pre-war figure again. The exodus in the early days of the war and the consequent decrease in the demand for gas saved the Company from a breakdown in supplies. While the return of the population has been excellent from the point of view of balancing the finances, it has meant a grim struggle during the winter to produce sufficient gas to meet the demand.

A year ago the late Sir David Milne-Watson assured the proprietors that after the cessation of fighting in Europe a scheme for the readjustment of gas prices, which would mean a general reduction, would be brought quickly into operation. So far the price has remained unchanged, but on Thursday Mr. Sylvester revealed that it was hoped soon to introduce a simple block rate, of which the first small block would be at the existing rate and subsequent blocks at lower rates. The Governor has himself made a close study of the relation of costs to prices, and the Directors have agreed that their first duty is to cheapen the price of gas to those consumers who take a reasonable amount. In the case of prepayment consumers, who comprise something like 73% of the domestic load and embrace the majority of the poorer consumers, it has been decided that the supplement, which is 2d. per therm in the major part of the area, and which has hitherto been charged on every therm passing through the meter, should be curtailed by charging it on a limited number of therms in each year.

Nationalization was inevitably one of the main topics of Mr. Sylvester's speech. Although the British Gas Council has decided that it must keep out of the political arena and accept the situation, Mr. Sylvester, who, besides being Governor of the world's largest gas undertaking is Chairman of that Council, sees no reason why any undertakings or persons engaged on the Industry should be precluded from expressing their views. What troubles him most at the present time is the lamentable state of uncertainty that has been created. As he sees it the worst aspect of the Government's decision is the long gap which must elapse between the announcement of the decision and its implementation, which may not take shape until a year or even two years later. This state of uncertainty, if it continues for much longer, will, he said, have serious effects upon the Industry itself and may even bring the experiment to failure. On the question of compensation, he will do his best in the interests of the proprietors, not forgetting the co-partners, who hold about £1,000,000 of Ordinary stock. No one knows how the consumers are to benefit from the nationalization of the Company. "The answer may simply be," said Mr. Sylvester, "that to sweep away this Court of Directors and to substitute some other body composed of better—and more ruthless—men would do the trick. I am far too modest to deny the possibility." Stockholders would have been interested to hear the Governor's views on the recommendations of the Heyworth Committee, but to that extent they were disappointed—the Heyworth Report was not even mentioned.

Although Mr. Sylvester's speech was much shorter than that of his predecessor last year (and part of it was devoted to a worthy tribute to Sir David and his work for the Company and the Industry) it dealt adequately with all the main features of the Company's achievements, and showed that the undertaking had successfully discharged its duty to proprietor, employee, and consumer alike. Whatever may be the motive for nationalization, it has not to the Governor's knowledge been suggested by any member of the Government that it is because the Company has failed in its duty.

Personal

Mr. A. HAROLD SAYERS, Engineer and Manager of the Aberystwyth Gas Company is shortly leaving to take up an appointment with the Control Commission. He is succeeded by Mr. I. W. THOMAS, Assistant Engineer and Manager, Neath Gas Department.

* * *

Mr. R. M. WILKINSON, whose appointment as Engineer and Manager of the Nottingham Gas Department was announced in the "JOURNAL" of Feb. 13, asks us to state that he is not, as mentioned in the paragraph, a chartered accountant.

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Mr. H. BOTTOMLEY, who has been Sales Manager with the Caledonian Corporation, Edinburgh, since August, 1936, is severing his connexion with the Corporation, having joined the firm of Jas. R. Thomson & Co., Ltd., 6–10, Blythswood Street, Glasgow, C. 2, as a Director.

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Mr. MISHA BLACK, O.B.E., F.S.I.A., has been appointed Industrial Design Consultant to the Gas Light and Coke Company. Mr. Black will advise the Company on all design problems, especially those concerned with exhibitions, showrooms, window displays, appliances, &c.

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Mr. F. ROBINSON has retired from his position as Accountant to the Kettering Gas Company after 47 years' service. On Feb. 19 he was presented with a signed photograph of the members of the staff by Mr. T. E. Maddocks, a former Managing Director, with whom Mr. Robinson had been associated for many years.

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At a meeting in Paris on Feb. 8 Mr. EDWARD CHARLES LEJEUNE, M.S.E., Assoc.M.Inst.Gas E., of 215, Kidbrooke Park Road, Blackheath, was elected a Membre Associé of the Société des Ingénieurs Civils de France. The Société, which is the premier engineering institution of France, was founded in 1848 by graduates of the Ecole Centrale des Arts et Manufactures, Paris.

* * *

The British Coking Industry on Feb. 19 gave a complimentary dinner to its Chairman, Mr. RALPH ALSOP, C.B.E. Representatives of the districts of Durham, Yorkshire, Derbyshire, and South Wales paid tribute to the work done by Mr. Alsop on behalf of the Industry, extending over a period of 15 years. His work in the formation of the International Coke Association, of which he has been Chairman since its inception in 1937, was particularly mentioned, together with his leadership of the Industry during the war, when, under his Chairmanship the British Hard Coke Association was the organization which negotiated with the Government on matters affecting the coking industry and which so managed its affairs that the industry was able to meet all demands made upon it during the war. Mr. E. Hunter, Chairman of the British Iron and Steel Federation, referred to the outstanding work done by Mr. Alsop during the war, when he was Deputy-Controller in charge of supplies of the iron and steel industry. Lord Hyndley referred to Mr. Alsop's powers of leadership and tenacity of purpose. Mr. F. Scopes (Managing Director of Stanton Ironworks) made a presentation to Mr. Alsop on behalf of the Industry.

Letters to the Editor

Plain Speaking

DEAR SIR,—You do yourself credit in the Editorial pages of the "JOURNAL" of Feb. 13 by speaking plainly and bluntly, and you will not mind, therefore, if this letter is in the same strain.

Generally, the First Report on Radiant Heating does not seem to find favour in your eyes. It is unfortunate that your comment, "The report, we think, did not add anything considerable to our knowledge of fundamental physics," should appear along with other negative remarks in such close proximity to your final adverse criticisms of the language of the report. The reader receives the impression that you are attempting to belittle the work that has been accomplished.

The report was from a scientific body to (presumably) scientific people, and I wonder whether such literature could be expressed adequately or even intelligibly in basic English. Perhaps one day someone will try it, and maybe we shall then be in a stronger position to pass fair comment.

The term "flux density" has been widely used in connexion with radiant heating, and no doubt was used as a term of convenient comparison, being obtained from our electrical competitors, who were first in the field with "infra-red." It is a good term, and very explicit, as it does not involve the energy emission of the radiator itself as does your substitute wording. Your remarks about "this pretentious jumble of words" are more than blunt, and it would have been fairer to the Authors of the report if more of the context had been quoted.

Let me say that I have read with great interest the excellent Papers on radiant heating produced from the Gas Industry. The Papers of Andrew and Chamberlain, Atkin, Carne are examples, and this First Report of the Gas Research Board has to me at any rate proved a comprehensive and informative document, fitting of praise rather than the fiery comment you have given it.

The Yorkshire Industrial Gas Centre, Ltd.,
Meadow Lane Gas-Works, Leeds, 11.
Feb. 18, 1946.

Yours faithfully,
D. C. GUNN,
Engineer, Manager, and Secretary.

DEAR SIR,—May I be permitted to take exception to the policy advocated in your leading article entitled "An Academic Exposition" in the "GAS JOURNAL" of Feb. 13.

With the possible exception of the section devoted to the electrical set-up of the measuring gear employed, the Gas Research Board's excellent report on Radiant Heating should be capable of being read and understood by any member of the Gas Industry who has reached an equivalent technical educational standard to that required to pass the Institution of Gas Engineers' Higher Grade Examination.

If, indeed, the terms used in this report are unintelligible to the mass of fuel technologists within the Gas Industry, then their standard of technical education is low compared with the general standard obtaining in other fuel industries.

The answer, surely, should be that this standard should be raised rather than that the style of the Gas Research Board scientists should be cramped by having to write down to the general level of the Gas Industry's technical personnel.

The terms to which you refer are used in the report because they express most definitely the arguments being put forward, and they are not incorporated to "blind the reader with science." The Heyworth report points out that "there would seem to be no need for a narrow and specialized form of training" in the Gas Industry.

In many instances, particularly in provincial centres, such training as is given tends to retain terms used 100 years or more ago, and as a consequence our technical men are generally uninformed of terms and trends in allied branches of modern fuel technology; not so, apparently, the staff of the Gas Research Board.

It is surely the province of the Gas Press to *précis* and generalize technical reports so that their themes may be apparent and appreciated by the sales and commercial personnel of the Industry.

It is therefore regrettable that the policy advocated in your article tends towards an apathetic attitude in the Industry's becoming conversant with modern fuel technique.

25, *Cavendish Avenue*,
Allestree, Derby.
Feb. 18, 1946.

Yours faithfully,
A. C. JENNINGS.

W. J. Smith Presentation

DEAR SIR,—You were good enough to draw attention to the presentation which the members of the British Gas Council and others are making to Mr. W. J. Smith to mark his outstanding work, over many years, for the National Gas Bodies.

Since it has been decided to close the Fund on March 14, it would be helpful if any outstanding contributions, not exceeding one guinea each, could be sent to me before that date.

1, *Grosvenor Place*,
London, S.W. 1.
Feb. 21, 1946.

Yours faithfully,
J. R. W. ALEXANDER,
General Manager,
British Gas Council.

The Heyworth Report

DEAR SIR,—Were you not too lenient in your criticism of the Heyworth Report? No doubt it gives a good historical account of the Gas Industry and its development, and it is right in desiring more co-operation between neighbouring gas undertakings. But does this necessarily imply that all the local concerns, with their local knowledge and local pride, should give place to ten Regional Boards nominated and controlled entirely by one man—the Minister of Fuel?

Under this plan no County or Borough Council will have any right of speaking for the inhabitants of its area; there will be no shareholders to gain by the efficiency, or lose by the mistakes, of Directors. In short the Gas Industry will pass into the control of a totalitarian régime.

With unusual modesty the five members of the Committee "do not regard themselves as a competent body to lay down a basis for determining the price" at which the various gas undertakings—company, municipal, or other—shall be acquired. But they seem to suggest that company undertakings shall be bought out at market value and municipal undertakings on an output basis.

As there will be no shareholders in the new régime, the Committee have to find someone to bear possible losses. They fix upon the Government—*i.e.*, the taxpayer—but they would give him "an overriding commission of ¼% p.a. to be paid by the Regional Boards on the amount guaranteed."

2, *St. Peter's Terrace*,
Cambridge.
Feb. 20, 1946.

Yours faithfully,
J. E. ALLEN.

Heat in the Home

DEAR SIR,—In a recent issue of the *Economist* there was an article, "Heat in the Home," based on No. 19 of the Post-War Building Studies, "Heating and Ventilation of Dwellings," the report of the "Egerton Committee." This article may be taken as the considered view of the educated but non-technical citizen. "For the first time," the writer says, "the relevant facts have been brought together and published. . . . In such a comprehensive study" he found "much that is new and indeed startling." What did he find new and startling—and what does he conclude ought to be done about it?

"The low efficiency of electric heating—it is credited at best with 18%—will surprise many people." He does not think it necessary to mention the minimum efficiency with which it may be credited. That is reserved for the gas fire, which "comes out rather better . . . with a 'coal economy efficiency' ranging from 15 to 45%." These low figures are derived, evidently, from the "gas production efficiency." The ordinary gas fire is credited with 50–40% test-bench efficiency, reduced to 45–32% "appliance efficiency," making "coal economy efficiency" 33–23% on the basis of 73% thermal efficiency of the gas-making process and 22–15% on that of 48% "gas production efficiency."

Putting the two together (gas and electricity) "these comparatively low overall efficiencies . . . are . . . hardly capable of much increase. On the other hand, there is considerable scope for raising the present very low efficiency of solid-fuel appliances. . . . The new and improved solid-fuel appliances are . . . the only types of equipment whose heat output is more than half that of the coal consumed."

The "new and improved" solid-fuel equipment, as yet untried, is presumably the only competitor which stands a chance against a gas fire which has sunk so low as 15% efficiency and cannot get above 45%.

The writer does see, in one part of his article at least, though not apparently strongly enough to affect his conclusions, that thermal efficiency is not everything. He is shocked by the facts of smoke pollution. "Even if considerations of waste and heating needs did not themselves cry out for better methods of domestic heating, the necessity of tackling the smoke problem would do so."

Going into detail, the writer sees that the tenant who has improved his heating methods by installing coal-saving and smoke-saving appliances continues to finance in the rent the discarded appliances provided by the landlord—and he appreciates the value of the analysis in the Report of several alternatives for achieving the desired ends.

The principle of "freedom of choice" is approved—but it must be freedom to use electricity for "topping-up" in the bedrooms. The conclusion is that background heating and water heating are to be "combined in a single, efficient, and smokeless solid fuel appliance in the living room, requiring one brick flue . . . electric plugs for topping up in the bedrooms . . . and . . . both gas and electric points for cooker and auxiliary water heater in the kitchen."

In a sort of post-conclusion two points are noted: (1) That even if adequate heating appliances were installed in the new houses it would be "a long time before the majority of the population were affected." Not a glimmer here of the economic wisdom of a definite campaign to eliminate smoke-producing apparatus altogether! And (2) that the new houses must be cheap "particularly (*sic*) in respect of unnecessary flues." The recommendations of No. 19 are thus finally ignored.

"In order that the consumer may have reasonable freedom of choice," says the Report, ". . . . other bedrooms should be provided with flues having a cross-sectional area of 30 sq. in. so that gas fires may be used if desired," and "provision should be made for ventilation irrespective of the method of heating and one-way . . . is by the flues mentioned above."

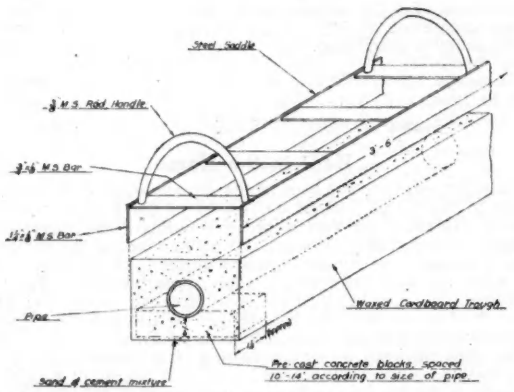
Yours faithfully,
"ECONOMIST."

Feb. 14, 1946.

Pipe Protection in Sydney

DEAR SIR,—Mr. H. J. Escreet's remarks in the "JOURNAL" of June 27, 1945, prompt me to give a brief account of our experience with the protection of mild steel service pipes buried in Sydney soils having a pH value of 5.5 to 6.5 (*vide* my article, "Corrosion of Underground Mains and Services," "GAS JOURNAL," Feb. 5, 1936).

For the past eight years we have used a Portland cement sand mixture (1 : 3) one inch thick on the pipes, and on occasions they have been unearthed, because of building alterations or for an enlargement on the service, and have been found to be in excellent condition, even in wet clay soils where unprotected pipes failed in less than two years.



North Shore Gas Company, Sydney, North, New South Wales.

Mention is made by Mr. Escreet of wooden formers. For some time we used asbestos-cement troughing, but in recent years we have used cardboard in three-foot lengths, 3 in. wide for 1-in. and 1¼-in. diameter pipes, and 4 in. wide for 1½-in. and 2-in. diameter pipes. This is creased longitudinally to form three equal sections to facilitate bending into the form of an open trough. It is waxed to render it water-proof, and so to prevent the cardboard becoming soggy for a sufficient length of time to allow for the initial set of the concrete.

To prevent the sides bulging due to the weight of the wet concrete, a steel saddle, shown in the accompanying sketch, is placed over the troughing before the mixture is poured in and then removed when the earth has been placed alongside the cardboard former. This procedure has proved very successful, and this form of troughing is cheaper than wood or asbestos cement and, of course, is left in the ground.

Yours faithfully,
T. W. HUGHES.

Pressure Gauge Tar Extractor

Measurement of foul gas pressures presents difficulties on account of the tendency for tar to be deposited in the measuring instrument. A simple and effective form of tar extractor for use with pressure gauges has been developed by the Metronic Instrument Co., Ltd., Smethwick. The gauge itself is a standard Metronic Type 141 single column gauge of any desired range, the popular size being 30 in. W.G. To keep the gauge clean its connexion is not made straight to the gas main, but to an intervening tar extractor. The extractor consists of a steel reservoir having a capacity about 10 times greater than the gauge pot. Pressure is admitted to the top of the reservoir, which carries a drain plug at the bottom.

Gas may pass upward from the reservoir through a coarse gauze to a breather chamber of similar capacity, which is filled with cotton-wool, and thence through another gauze to the gauge pressure connexion. The breather chamber lid is secured by three wing nuts so that the cotton-wool can be quickly changed when necessary. The extractor can be cleaned out in a matter of two or three minutes, and this operation is necessary about once a month if the gauge is reading continuously for 24 hours per day. The principle adopted in the extractor is that there should be minimum movement of gas within it, allowing the tar good time to condense and settle.

Diary

Mar. 2.—Scottish Junior Gas Association (Eastern District): Visit to Castlecary Works of J. G. Stein & Co., Ltd., Bonnybridge.

Mar. 5.—Midland Junior Gas Association: "Gas-works Liquors and their Disposal, with Special Reference to Electrostatic Tar Precipitation," G. J. Rimmer.

Mar. 6.—Industrial Gas Centres Committee: Sheffield and District Gas Company, 10 a.m.

Mar. 8.—London and Southern District Junior Gas Association: "Domestic Gas Cookers—The Design of the Hot Plate," E. W. B. Dunning, Gas Industry House, 7 p.m.

Mar. 12.—British Gas Council: Gas Industry House, 3 p.m.

Mar. 13.—B.G.C. Domestic Development Committee: 2.30 p.m., Gas Industry House.

Mar. 20.—Manchester and District Junior Gas Association: Visit to works of Manchester Oxide Co., Ltd. Short Paper by by H. B. Avery.

Mar. 21.—Midland Counties Coke Association: Eighth Annual General Meeting. King Edward House, 135, New Street, Birmingham, 2.30 p.m.

Mar. 22.—London and Southern District Junior Gas Association: Reception and Dance, Caxton Hall, Westminster.

Mar. 23.—London and Southern District Junior Gas Association: All-day conference at Gas Industry House, including six Technical Papers covering Education, Gas Manufacture, and Gas Utilization.

Mar. 23.—Midland Junior Gas Association: President's Day; Visit to Bilston.

Mar. 26.—Southern Association of Gas Engineers and Managers (Easter District): "A New Method of Increasing Retort Tightness," A. Bird, London Manager of West's Gas Improvement Co., Ltd., Gas Industry House, 2.30 p.m.

Intensive Courses for Gas Engineers

The Gas Education Committee of the Institution of Gas Engineers announces that, in collaboration with the Ministry of Labour and National Service and the Ministry of Education, arrangements have been made for the initiation of intensive courses for gas engineers in Gas Engineering (Manufacture) and (Supply) at Bournemouth, commencing on April 29. The courses are to be conducted by the Bournemouth Municipal College in conjunction with the Bournemouth Gas and Water Company, and are to consist of two terms at the Municipal College, at which ancillary subjects will be studied, while the main subject of Gas Engineering (Manufacture) or (Supply) will be studied at the works of the Gas Company. It is proposed to interpose between these two terms at the Municipal College a period of practical training at a gas undertaking, and it is anticipated that participants will be enabled to take the Higher Grade Examination of the Institution of Gas Engineers by Christmas.

Candidates for these courses must have obtained the Ordinary Grade Certificate in Gas Engineering (Manufacture) or (Supply), or have reached a standard approximating thereto. These courses will be available for ten Students in Gas Engineering (Manufacture) and ten in Gas Engineering (Supply), but it is hoped also to initiate courses in Birmingham in the course of the next few months.

The Government proposes to pay maintenance grants under the Further Education and Training Scheme to eligible candidates to enable them to take these courses and, while the Regional Appointments Officer of the Ministry of Labour and National Service will decide whether or not a candidate is eligible, the following will probably be of assistance to intending applicants in deciding whether or not they are likely to receive an award :

(1) A candidate is normally eligible only if his training has been interrupted by the war. Thus, for example, a candidate who went to Evening Classes up to 1936 or 1937 and then discontinued before completing the Higher Grade Certificate would not be eligible, since it was not the war which interrupted his studies.

(2) It is not the intention of the scheme that candidates shall be encouraged to change their profession by means of intensive courses, and grants will not usually be made to candidates seeking to become gas engineers who, before the war, were engaged in or were training for another profession.

Further information may be obtained from the Secretary of the Institution of Gas Engineers, 1, Grosvenor Place, London, S.W. 1.

At a Meeting of the Newcastle and Gateshead Chamber of Commerce, Mr. H. H. Peile moved a resolution deploring the Government's action in including the coking industry in the Bill to nationalize coal. Coke, he said, had been dragged into the Bill in some obscure way, but it was not even suggested that it would improve the possibility of renewing exports. The North-East's greatest single export trade, coal and coke, lay dead. Before the war the district shipped 3,000,000 tons of coal, and Durham County sold 1,500,000 tons of coke abroad. The coking industry was a separate, well organized manufacturing industry, and it was not claimed by anyone that it was being taken over for any reasons of inefficiency.

Civil Engineering as a Career

A pamphlet of interest to young men who intend to become civil engineers, and to parents, guardians and schoolmasters responsible for advising on the choice of a career, has been published under the above title by the Institution of Civil Engineers. The pamphlet traces the history of civil engineering, including the foundation of the Institution, and deals with the general education and the scientific and practical training desirable for those who intend to enter the profession. A liberal education with no particular specialization in the early stages is advocated, and emphasis is laid on the desirability, if possible, of intending engineers taking full-time university or technical college courses leading to a degree recognized as exempting in part from the Institution examinations. Full particulars are given of the examinations conducted by the Institution for those who are unable to take such courses, as well as the practical training which a young man must undergo before becoming eligible for admission to the Institution.

Young men who aspire to become engineers are urged to complete their theoretical qualifications as early as possible, and at the outset of their careers to seek opportunity for acquiring wide knowledge and experience rather than immediate financial advantage. The pamphlet contains chapters dealing with the various branches of civil engineering, with their particular requirements and activities, and the prospects they offer.

Co-operation in Engineering

The need for the engineering industries to be able to speak with one voice on behalf of all engaged in them was stressed by Viscount Davidson, President of the Engineering Industries Association, at a meeting of Scottish engineers at Glasgow on Feb. 21. We had, he said, a tremendous task ahead if Great Britain was to survive, and to engineering would fall the major responsibility for success or failure. We were moving into a new world in which individual enterprise, initiative, specialization, and drive not only must be paramount, but must operate within the larger field of national policy. Ever since he became President of the Association he had been convinced that in matters of policy the engineering industry should speak with one voice. Industrially—free from any partisan politics—the partners in the industry, in each undertaking, management and operatives, directors and shareholders who lent the money without which no undertaking could be begun should co-operate in the task of achieving the maximum and most efficient production.

A deputation from the A.E.U., led by Mr. Jack Tanner, recently waited on the Minister of Supply. The suggestion he made was for an Advisory Engineering Board representing both sides of the industry under an independent Chairman. The trade unions were organized. He believed the engineers who owned and managed the undertakings must also be organized in order that they might truly represent the interests of the whole industry.

Hygenic Cremation

Of the 58 crematoria now operating, 47 employ gas as the incinerating medium, 4 are coke-fired, 5 (one of which uses both gas and electricity) are heated by electricity, one uses oil, and one "bottled" gas. The reason for the preponderance of town gas is that it is essentially efficient for the purpose. There are now eight furnaces at Golders Green. Conversions have been made from solid fuel to gas at Golders Green, Manchester, Sheffield, Hull, Woking, and Liverpool, and further conversions are now being negotiated.

Recent developments have been directed to improvements in technical operation, the application of heat, and the provision of recuperation for heating the air required for oxidization. The outward design of furnace casings, for aesthetic reasons, has been improved in appearance.

In most cases incineration can be carried out in a hot furnace by pre-heated air from the recuperator only; in the event of interruption of the supply of power to the turbo blower cremation can be completed by the use of natural draught burners provided as an auxiliary.

Incinerating furnaces of British design were installed in this country about 1923. Two previously installed, of French origin, were superseded shortly afterwards. The modern gas incinerator is the outcome of many years' experience in this particular class of work, improvements having been made from time to time in the last 20 years.

Here are a few figures relating to gas consumptions; they are based on eight cremations, and show that the average time per cremation was approximately an hour, and the gas rate 624 cu.ft. (500 B.Th.U. per cu.ft.):

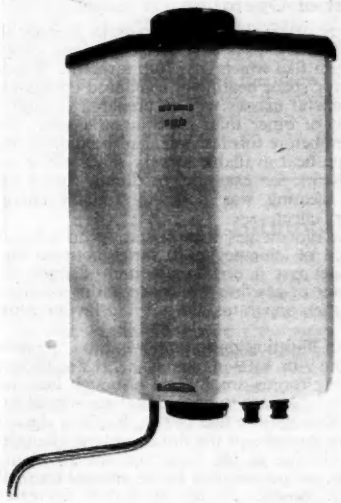
Body.	Temp. of Furnace at Start.	Time.	Gas Used.
a	460° C.	75 min.	855 cu.ft.
b	500° C.	60 ,,	410 ,,
c	540° C.	70 ,,	540 ,,
d	480° C.	55 ,,	205 ,,
e	500° C.	75 ,,	1,410 ,,
f	600° C.	50 ,,	190 ,,
g	500° C.	50 ,,	770 ,,
h	615° C.	60 ,,	615 ,,

From cradle to grave—or, rather, from cot to crematorium—Gas Serves.

A New Single-Point Storage Gas Water Heater

Over a considerable period Radiation Ltd. has, through its Associated Companies, produced a steadily increasing annual output of single-point storage water heaters, and it is therefore of interest that in anticipation of future requirements a new model of this type has been developed, which is known as S.12/2 "New World" single-point storage heater.

This water heater embodies proved features based upon district experience of large numbers of this type operating over long periods under widely differing conditions of gas and water supply, and on schemes in which the low maintenance cost has been subject to close actuarial supervision. Simplicity has characterized the design of these heaters, and records of their continuous use, year after year, and despite a minimum of attention, show freedom from complaint, and establish beyond all question their service value to consumer and gas undertaking alike.



The "New World" single-point storage gas water heater is a two-gallon copper storage vessel with external lagging and a vitreous enamelled outer casing. The top of the storage vessel is closed by an inner close-fitting lid (with loops attached for easy removal) and surmounted by a black vitreous enamelled top cover. Through this storage vessel passes the combustion tube, consisting of a laminated asbestos cement tube which is sheathed in light-gauge tinned sheet copper upon its water face. A removable baffle of cast iron and mild steel construction treated with a highly resistant vitreous enamel coating ensuring the long life of this component, fits within the combustion tube. This is a proved form of construction which eliminates condensate formation. The burner, which utilizes 3 Bray jets, is located towards the bottom of the combustion tube, and carries a small synthetic plastic dust tray. The top of the combustion chamber is covered by a neat plastic cap, through which combustion products are directed forwards in their passage.

Control of water temperature is by "Regulo." The patent cleanable feature is incorporated, which permits *in situ* removal of the valve without disturbing the temperature setting. This feature has special significance from the maintenance aspect, in that it facilities the immediate removal of gum, &c., from the valve seatings. The "Regulo" controls the gas input, so that each withdrawal of water is accompanied by an increase in the gas consumption until the hot water withdrawn has been replaced. The correct gas rating is attained by operating the gas adjuster in conjunction with a pressure gauge temporarily connected to the burner pressure point.

External dimensions give the heater a minimum forward projection, and the design has a character which will harmonize with the most modern surroundings. Fittings are made as unobtrusive as possible, and by the introduction of a covered broken water feed a balanced external appearance is produced.

The normal gas rating of the appliance is 6,000 B.Th.U./hr., and the whole of the contents is heated to deliver two gallons at about 140° F. within 30 minutes, for the consumption of about 3,000 B.Th.U. The contents of the appliance are maintained at full temperature with a gas consumption of about 500 B.Th.U./hr. and two gallons of hot water are available at any moment for instant use. This heater is free from valves dependent upon water pressure, and the low maintenance and low maximum gas rate make little demand upon the gas services.

A safety cut-off valve is available for the heater as an extra. This device, of robust construction and positive action, is embodied within an easily-removable burner which is interchangeable with the standard type. It consists of a bi-metallic strip of hairpin form, heated by contact with the flames, which bends and opens a main valve, keeping it open so long as the heat is applied. A trip lever serves to set the valves open initially for lighting.

The S.12/2 "New World" Heater is an attractive appliance for the user by virtue of its economical service and good appearance, and for the gas undertaking because of its low installation and maintenance cost.

Gas Utilization—Future Prospects and Needs in the Domestic Sphere*

By Dr. HAROLD HARTLEY

(Vice-President of the Institution of Gas Engineers)

(*Concluded from p. 308*)

Cost of Operation

The cost of operation must have played a big part in limiting the popularity of the gas fire. In the past coal was cheap and people did not take kindly to using a fuel which cost 10d. a therm. Unless it is possible to supply gas for space heating at a reduced commodity charge, it is unlikely the general masses will be prepared to employ the fuel for the satisfaction of other than intermittent needs. The gas fire, in the form common before this last war, had been developed to satisfy consumers wanting heat available at very short notice and required only intermittently, as, for example, in dining rooms and bedrooms. Generally the heating was done by radiant energy, convection being a secondary effect.

The effective efficiency of radiant gas fires operating on a hearth and subject to the influence of chimney pull varies between 40% and 45%. Although in the past a certain amount of work was done to increase the efficiency of gas fires by incorporating means of generating convected heat, such apparatus did not find favour within the Industry.

In the case of rooms with ill-fitting doors and windows, excessive ventilation is produced by the 9-in. by 9-in. chimney. It was thought to be good to ventilate living rooms amply, and although heat was lost, the designer in the past took care to ensure that air should pass to the chimney not merely through the flue nozzle, but also through secondary vents between the canopies of the fire or around the sides. Physiologists now seem to incline to the view that the air change need not exceed 600 cu.ft./hr. per person, that is, the amount normally adequate to eliminate body odours. As the air-flow is decreased, the cost of heating will be noticeably reduced, and it will become less difficult to obtain the desired standard of heat comfort in the coldest weather. Although provided primarily for ventilation purposes, subsidiary or secondary vents have the additional advantage of lessening the effect of chimney pull on the radiant efficiency of the fire. Even with such an arrangement, however, it is not possible to transmit any appreciable amount of convected heat into the room by the mere addition of an extra casing to the appliance. The fire has to be designed specially to counteract the effect of chimney pull, in order to ensure that the framework shall remain hot when the appliance is in use at the foot of a coal fire chimney. One means of doing this is by adding a chimney pull break box. With such an arrangement and with attention to the effect of the various features in the design of the convector chamber, it is possible to produce fires which, while yielding an average efficiency of 60% when standing at the foot of a chimney, will suffer a total drop in heating power of not more than 10%.†

In the present state of the art it is improbable that there can be produced free-standing convector fires capable of yielding an efficiency much higher than 60% under the average conditions of domestic use, and when this type of apparatus is used it is more than ever important that the fitter shall appreciate how the appliance must be installed.

The cost of operating gas fires will decrease directly as the overall efficiency is increased.

Comfort

There are several factors which influence the sensation of comfor experienced by the occupants of a room in cold weather. It is a good many years since Margaret Fishenden showed that if the air temperature is as low as 45° F. it is practically impossible to remain comfortable with any air movement at all, even when radiant heat is being received on the front of the body. The experience of feeling the hands becoming chilled even though the legs are being roasted is by no means uncommon in the over-ventilated English living rooms. These sensations are experienced with all types of radiant fire, but they are less noticeable and less persistent when the flow of ventilating air is reduced.

It is now known that the quality of the heat emitted by the radiant source may affect the sensation of comfort, and much work has been done to try to obtain a better understanding of the suggestion sometimes advanced that the heat from gas fires tends to scorch exposed portions of the body. The investigations indicated that if the radiant energy penetrates the surface of the skin, the resulting stimulation of the capillary blood-flow leads to the production of a more comfortable sensation than is attained with less penetrative energy.

The distribution of the heat from the source has an important effect, both on the sensation of comfort and the efficiency of the heating appliance, but neither the mode of distribution of the radiant heat nor its quality is the sole factor in determining the design of the ideal appliance. It is desirable that the domestic fire shall give radiant heat, but in order to attain the required degree of comfort in inclement weather, some convected heat must be provided also. Information is still needed as to whether a definite ratio between the amounts of radiant and convected heat is desirable and, if so, what the ratio should be. The provision of convector fires, if satisfactorily designed, should mark another definite step forward. Such fires should in the future play a big part in securing the space-heating load for the Industry if a real endeavour is made to obtain it.

* * *

So far as the immediate future is concerned, the prospect is pleasing, but what will be the position ten or twenty years hence? The Industry must fix targets, and this could be done more satisfactorily if there were in existence an intelligence staff whose duty it was to draw up a general programme for development.* Normally it is not difficult to plan 10 years and, in some fields, 20 years ahead. So far as gas manufacture is concerned, can the target be set that 20 years hence the only fuel the undertakings will supply will be gas? Will it be desirable to have high-pressure gas piped to the domestic consumer's premises? What energy can the Industry supply, both physical and potential? The Industry will continue as a two-fuel Industry for a good many years to come, but it seems likely that ultimately gas only will be supplied, and that some process of complete gasification will be adopted, subject always to obtaining by-products which may play an increasingly important role in the affairs of the Industry.

Before the war it is probable the Gas Industry did not satisfy 25% of the household needs for the three heat services, and there is still three-quarters of that load to be obtained.

The three sections of the Gas Industry must more than ever pull together as a team, each determined to give of their best for the benefit of the whole.

The technicians and salesmen on the supply side can do much to influence public opinion. They can guide the architects and help local authorities to ensure that the great service which the Gas Industry can offer is made available to all sections of the community. Those in the Gas Industry must consciously play a greater part in our social evolution, and this will involve their taking more direct interest in domestic matters of general importance to the community. There is need for more work in the education of public opinion, especially that of women, both as to the progress which is being made and the services which are available, and there is a need to employ more women of sound technical knowledge and practical experience in the Industry itself. The most intimate contact with the householder is made by those who go to read meters or to attend to the maintenance of apparatus. Much thought should be given to training the staffs engaged on such work. Above all, the "back-door mentality" must be eliminated.

One of the advantages of grouping undertakings to give larger supply units, proposed both by the Industry's Post-War Planning Committee and by the Heyworth Committee, will be that improved prospects can be offered to attract men and women of intelligence and training to the Industry, which should then be even better equipped to meet external competition. The justification for integration and nationalization will be determined by the capacity of the resulting industry to face up to the changes which will undoubtedly take place in the future.

We are fortunate, or unfortunate—the qualification depends upon the point of view of the individual—to have lived during a period when the social structure of the most civilized portions of the world has been undergoing revolutionary change. One result has been an enormous development in the productive capacity of mankind, and in the ability of man to understand and use for his purposes the resources of nature.

After the 1914/1918 war there was great improvement in production methods in the engineering field. In the period between the wars progress continued, although at a much slower rate than had characterized the four war years.

Great though the developments were during that second decade of the century, they are much less significant than those which are associated with the period of strife now concluded.

* Paper presented to Scottish Junior Gas Associations' Joint Meeting, Glasgow, Feb. 9.

† From 63%-57% gross, when the air-flow up the chimney is increased from 1,500 cu.ft./hr. to 5,000 cu.ft./hr. in the case of a 10-in. fire.

* The Gas Research Board has recently appointed a Gas Production Committee to review and advise on investigations relating to the production of gas.

There have been, during the last six or seven years, scientific and engineering developments that quite surpass anything previously effected. The air has been conquered, there have been big advances in the field of chemical manufacture, in the medical field, especially in the preparation of bio-chemical substances, and above all in that sphere which is concerned with the production of energy. The work of the natural philosophers such as Rutherford and others has been applied successfully on a large scale. Prior to the war it was well known that in the laboratory physicists had found means of converting matter into energy. Few appreciated, however, that the practical application of such work was on the point of realization.

1 lb. of matter converted entirely into energy would yield about 400 million therms, whilst the combustion of the same amount of coal gives about 1/7th of a therm. In the detonation of an atomic bomb only a small proportion of the charge (about 1/1,000th part) is converted into energy in the atomic transmutation which is effected.

The point to be emphasized in the present connexion is that by transmutation of elements enormous amounts of energy may be released—much greater than anything with which engineers and others have had to deal in the past. So far as the industrial application of the phenomena of nuclear physics is concerned, the fringe of the development has as yet only been touched upon.

It is not generally known what rate of application could have been anticipated had such work been allowed to progress without political control. It may still be that within the lifetime of some of those within this room there will be seen a complete re-orientation of outlook, but I feel certain that, however great are the changes which may be envisaged, these will not take place too rapidly to allow of general industrial adjustment. In fact the rate of development may be controlled by the speed at which industrial adjustment can be effected.

So far as the Gas Industry is concerned, it will be necessary to ensure that on the technical side it is fully informed of the knowledge which is being accumulated, and that adequate steps are taken to see that it shall keep abreast of its competitors by the application of that new knowledge to the Industry.

The use of the principal products of the Gas Industry depends upon the application of known processes of combustion, but the fundamental work which has been done on combustion phenomena has not provided in the last forty years much in the way of new knowledge immediately helpful for our industrial development. By the 80's of the last century, Dixon, Le Chatelier and others, working on gaseous explosions, had provided information about the rate of movement of flame in the various phases from the initiation of combustion to the onset of detonation. Smithells' work on the bunsen flame was published in the 90's, and attention was drawn afresh to the phenomena of surface combustion by Bone and his school in the first decade of this century. Whatever the value of the researches which have been published in the last 40 years from the point of view of combustion theory, they have not been outstandingly helpful to the technician who is concerned with the application of the combustion processes in the domestic field. When comparison is made with the enormous amount of new knowledge which has been unearthed by the physicist in the same period, it is not unreasonable to suggest there is great need for scientific advance in the combustion field. In the 80's the physicist was concerned principally with molecular phenomena, but in the intervening period he has probed the structure of the atom and has effected a complete revolution in scientific thought. Modern combustion research does not appear to be keeping pace with these developments. Explosion experiments have been carried out at high initial pressures, and, although some new chemical changes have been effected, as, for example, the activation of nitrogen during the explosion of CO and air under pressure, the stage has not yet been reached in which there is any sudden increase of energy emission with consequent pressure increase, or any increase in the evolution of heat on combustion. If the combustion process can be effected so as to cause greater changes in the "energy levels" of the electrons in their orbits, or to induce a complete change in a small portion of the product by nuclear disturbance, an important step forward would be made. Published combustion researched do not seem to provide an inkling of the possibilities of such changes, but it may be the physicist will yet point the way.

There is need for those concerned with fundamental research on gaseous combustion to have a stock-taking and review the position. If scientific workers are to be attracted in numbers to this field of investigation there must be a new outlook. There is need for someone to light a torch and keep it blazing, so that the best of the young men may be attracted, and some of them in their turn become inspired. This is a matter to which serious thought should be given, and is especially important to-day as propaganda is suggesting it is only necessary to spend money on research to obtain valuable information. Concentration on *ad hoc* research is not sufficient. There is much to be learned from *ad hoc* investigation, but we are in the midst of a revolution, and thought must be given to the need for re-casting the whole structure of the scientific work on which our development depends.

An organized industry such as the Gas Industry might well give a lead. Have not technicians the advantage of a greater urge than can apply to those who are somewhat sheltered from the stress of modern life, and may they not be in a position to see more clearly what is really needed? Certainly their experience should be helpful. Of the money that is spent on behalf of the Industry on research, a proportion should be allocated to the study of basic problems, either at the universities or within the Industry, without thought of any immediate return or further counting of the cost. Would it not be helpful if a small group of people were given the task of advising the Industry on the action to be taken in connexion with fundamental research?

Electrical competition will grow, and the direct inspiration derived by technicians in that field as a consequence of the developments in the sphere of physical science will make the task of showing parallel advances increasingly difficult. The protagonists of electricity will contend that they can offer an ideal service, and that electricity may be the sole energy required in the future. However that may be, those engaged in providing the gas service, whether they are concerned with plant design or plant operation, or gas utilization, must take advantage of the spur of electrical competition. It must not be overlooked that one of the finest things that ever happened to the Gas Industry has been the rise of the Electrical Industry. Gas has been supplied for domestic use for a century and a half. With increasing age, industries, like individuals, tend to become too conservative, to count the cost too much before taking a risk, and thereby stifle enthusiasm. Lest we all become pedestrian, excessive caution which hampers progress must be avoided, and above all, "Let us have no fear of the future, but think of it as opportunity and adventure."

Wire Rope Slings and Sling Legs

The series of British Standards dealing with rope, chain and terminals for lifting purposes has been extended by a new British Standard, B.S. 1290: 1946, which is alternative to and comparable with British Standard 781 for chain slings. The need for a comprehensive standard for wire rope slings has long been obvious. The slings in B.S. 1290 are made up from standard wire rope and components. To limit variety and ensure safety while affording adequate choice, the wire ropes are restricted to three constructions, all of one tensile range, formed into three kinds of sling leg fitted at each end with a thimble. The effect of these limitations is to standardize the size of the rope for a given working load and so facilitate correct selection by the actual slinger.

The working loads of the slings range from 5 cwt. to 15 tons, single, double, treble and quadruple. The standard components for the slings are taken from B.S. 302 (wire ropes for cranes), B.S. 462 (thimbles for wire ropes), B.S. 482 (hooks for cranes and slings), and B.S. 781 (chain slings, rings and links). Permissible working loads for two-legged slings at various included angles are given, with the decimal factor and percentage reduction due to sling angularity. It is interesting to note that a 60° included angle reduces the permissible load by 13½%, 90° by 29½%, while 120° exactly halves the permissible load of the two legs at 0°. In other words a two-legged sling rated at 10 tons at 0° becomes a 5-ton sling at 120° included angle. To increase the utility of the specification the N.P.L. formula for rings in B.S. 781 has been calculated to provide a comprehensive table which gives increments for scantlings, internal diameters and working loads.

Ten illustrations of standard slings are to scale, and for easy reference the pages facing each figure give an epitome of the make-up of the sling or sling leg to allow selection, inspection and manufacture without continual reference to the preceding text. Copies of the Standard are procurable from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 3s. 6d. post free.

A Cargo of a thousand tons of road tar was loaded at Cardiff recently for use at Rouen.

Owing to Increases in wages Stratford-on-Avon Borough Council has decided to raise the price of gas by 3d. per 1,000 cu.ft.

After March 9 Messrs. R. Ingham Clark & Co. and R. Gay & Co. (makers of industrial finishes and decorative materials) will operate from their new headquarters at Westmorland House, 127/131, Regent Street, London, W. 1, to which all communications should be addressed. Telephone number: Regent 0831.

A Conference of all trade union executives was suggested by Mr. Isaacs, Minister of Labour and National Service, in his address to the General Purposes Committee of the Trades Union Congress. The purpose of the conference was to enable Ministers to give candid statements on the country's industrial and economical position. It will be held in London early next month.

The National Union of Manufacturers, representing 4,000 industrialists, has submitted a series of recommendations to the Chancellor of the Exchequer in connexion with his forthcoming Budget. The memorandum asks for reduction of controls to an absolute minimum; adoption of a settled wage policy; rigorous pruning of expenditure; full reliance on income tax to meet unavoidable expenditure; codifying and simplifying of income tax so that the industrialist may himself compute his liability without recourse to professional advice; abolition of E.P.T. and N.D.C., which should not be replaced by any new selective taxes; progressive decrease in rate of income tax; early removal of purchase tax; and orderly disposal of Government surplus stocks.

Further Distribution at Tottenham

The following discussion took place on the Paper on "Further Distribution at Tottenham," which Mr. **E. O. Rose** (Tottenham and District Gas Company) presented at a meeting of the London and Southern District Junior Gas Association on Feb. 8. The Paper was published in the "JOURNAL" of Feb. 20 (p. 313).

Mr. **H. J. Escreet** (Distributing Engineer, Gas Light and Coke Company) said the extension of the Tottenham Company's area between 1928 and 1939 provided a complete range of development from the fully built-up urban area, with a high concentration of load, to the most sparsely populated rural districts, and Mr. Rose's account of the development of the distribution system provided a summary of all methods from low-pressure supply, backed up by large feeder mains, to direct high-pressure supply, with small mains working at pressures of 30 lb. per sq. in. and upwards. He was glad to see the Author had used the Lacey formula for his mains capacity calculations. Many people had said that this formula was too complicated, but when used in the way indicated in fig. 2 calculations could be made very quickly. Table I was very typical of similar calculations in that it showed little difference in total cost over a range of three or four sizes of mains. In view of the subsequent extension to Hoddesdon, he expected Mr. Rose wished that the original choice of size for the Ponders End to Waltham main had been 12 in. instead of 10 in., but it was easy to be wise after the event.

He was interested in the method adopted for automatic filling of holders, and the way the system had been modified from time to time to meet extensions and changed conditions of working. Mention was made of a number of small low-pressure systems supplied through Peebles or Reynolds governors. Were vents provided to prevent the pressure building up in the event of the governor not shutting off completely at night? It was mentioned that a pressure of 60 lb. per sq. in. would have been required at Hitchin if the possible maximum consumption had been provided for in the first instance. Would not a larger main have been used in that case rather than trebling the initial pressure? The increase in capacity of the Hitchin to Biggleswade system by installing additional high- and low-pressure storage to enable full use to be made of the compressing plant, both by night and day, must have reduced the cost of pumping per therm supplied very considerably, and he would be pleased if Mr. Rose could give some figures for load factor and actual costs per therm before and after the installation of the additional storage. The Author had mentioned the surprising saving in cost of mainlaying due to laying mains without fall and with no syphons. He would be glad to know what percentage saving was obtained in that way. He felt that even with dry gas it was desirable to lay to a fall and insert syphons at low points in case of a leakage of water or the presence of small quantities of condensate, which were always possible, due to failure of drying or cooling apparatus on the outlet of compressors. He noted that the 10-lb. pressure reduction at Hitchin for drying the gas was not maintained at night when filling the high-pressure holders. Was the 10 lb. per sq. in. reduction maintained at all other times, or had it been found necessary to use all available pressure at peak loads?

Departmental Organization

He was not quite clear as to the organization of the mains department referred to in the Paper. As he read it the new mains department had taken over the whole of the main work, leaving only service laying to the distribution staff, and the mains department had also taken over the trunk main work, which was previously under the engineering staff. Who dealt with emergency work—the distribution department or the mains department? In the Gas Light and Coke Company they had worked in the reverse direction. They used to have a separate trunk mains staff, who dealt with mainlaying for sizes over 12 in., but in 1939 this work was handed over to the divisional mains superintendents, who were now responsible for all main and service laying, and repairs to mains and services under the general direction of the distributing engineer. The chief reason for making this change was to obtain a decentralized organization for dealing with bomb damage to trunk mains, but it also avoided having two sets of people dealing with local authorities and other public utility undertakings in any given area. It also made the work of the divisions more interesting. Work confined to services and small mains got rather monotonous.

Lieut.-Colonel **J. A. Gould** (Distributing Engineer, South Suburban Gas Company) said that with regard to the use of steel tubes protected with bitumen and hessian, he was uncertain as to whether they were indispensable for conveying gas at the pressures referred to. In his opinion the question of the protection of steel tubes agains erosion was still a most important one, both when laid and throughout their life. They had a case at present of a 6-in. steel high-pressure main coated and wrapped as described in the Paper, which had become holed at three different points on the district. In each case it was laid in heavy Wealden clay. The main was laid about 21 years ago. In his view the consideration of a pipeline's resistance to corrosion and its probable life had strongly to be weighed against the question of mechanical strength. They had a number of 12-in. cast-iron mains laid during the last 12 years working normally at pressures up to 10 lb. per sq. in., and occasionally reaching 16 lb., some of which were jointed with fully turned and bored joints and flexible joints of the Staveley bolt type, and also with Johnson couplings, and they had had no trouble with them. It was worthy of note that the West Yorkshire grid scheme employed spun pipes with mechanical joints for medium pressures up to 35 lb. per sq. in. He was interested in the trouble experienced with rust in syphon standpipes, and he assumed these were of small diameter, say ¾ in. In his own case they found it necessary to enlarge theirs to 1¼ in. Would Mr. Rose say whether he had had his pipes coated internally or not. They had in the past had theirs coated, both steel and cast iron, and he had been most impressed during the war, when they had so many mains opened up by enemy bombing, by the good condition of the interior coating.

Shallow Main Laying

On the question of condensation in high-pressure mains, it was, of course, the general experience that the water was deposited in one or two syphons near the compressing plant. He was interested to note that recently the Tottenham Company had laid high-pressure mains without worrying about falls and with no syphons. Could the Author say if he had had any difficulties as a result of water entering fractured mains so laid from flooded bomb craters? With regard to the shallow laying of mains, he would like to know if any difficulties were experienced in lowering such mains for road widening purposes, particularly where service pipes had been connected. He would have thought that any initial saving might easily be outweighed by the cost of lowering at a subsequent date, particularly having regard to the difficulty of excavating beneath a main. He assumed that in connexion with this matter the recommendations of the Joint Committee of both Houses of Parliament on the breaking up of streets by statutory undertakers might influence the policy in the future.

On the subject of the flow of gas through pipes, he found the use of the special charts very interesting. They had always used Cox's formula in his Company, and checked many measured flows against those calculated by its use. The formula usually erred on the conservative side, but in practice they found it quite satisfactory, particularly in respect of old mains. It was strange that there did not appear to be available a standard calculator for high-pressure discharges in this country. The Americans had a standard type, which was sold by the *American Gas Journal*. This was based on the Weymouth formula (very popular with the Americans) except in respect of 3-in. mains, where Cox's formula was used. The Weymouth formula was used in the excellent nomogram issued by the Parkinson Stove Company. Their experience was that the Weymouth formula usually gave too generous results. The drawback to most of the nomograms available was that the maximum length of pipeline provided for was usually about ten miles. The American calculator referred to was extremely easy to use. With regard to automatically controlled floating holders, would Mr. Rose state if they had had any troubles caused by freezing, and what steps they took to provide against these? He would also be glad if he could say if the railway line between Waltham and Hoddesdon, alongside which his 12-in. main was laid, was electrified, and if so, whether they experienced any difficulty from electrical leakage.

District Governors

Mention had been made of two district governors, one at Wormley and one at Rye Park. What type of governor was used, as the inlet pressures varied from high pressure to holder pressure? Also, were they automatically loaded during the daytime? He assumed the high-pressure service governors were fixed inside the houses. Would Mr. Rose state how often these were maintained, and if he had had any rust or other troubles with them? He noted that the maximum demand from the 163 consumers in the Sewardstone Road area only averaged about 25 cu.ft. per consumer. This bore out the assumption most of them had made in deciding the sizes of supplies to groups of temporary bungalows. In connexion with this supply the remarks regarding the difficulties of obtaining holder storage were very important. Those difficulties would no doubt be aggravated by the application of the Town and Country Planning Act of 1944.

The Author's description of local high-pressure storage arrangements was interesting. He seemed to have been fortunate in having an electricity supply available to operate his compressor. The South Suburban Company had had automatic high-pressure storage plants for many years, two of which were still in use. In both cases, however, no electric main supply was available, and the compressors, which had a capacity of 1,500 cu.ft. per hour of free gas against a pressure of 60 lb. per sq. in., were driven by gas engines automatically started by an electric motor generator operated by storage batteries. Once the gas engine reached a speed of 600 r.p.m. the motor generator was driven by the gas engine recharging the accumulators. Obviously this created greater difficulties, and the use of several automatic devices. "Cut in" switches ensured that the plant would not operate unless the district pressure was up to a predetermined figure, and the pressure in the storage tanks was below a set minimum. The working of the

plant was stopped if the district pressure fell to a predetermined figure and/or if the pressure in the tanks reached the maximum setting. Their plants had a storage capacity of 30,400 cu.ft. and 22,800 cu.ft. measured at atmospheric pressure. The gas engines and compressors were water-cooled, and during the winter the water in the cooling tanks was heated by means of a small theromostatically-controlled water heater.

The Author had referred to a Reynolds "Duplex" governor. Would he kindly state what was meant by this? Did it imply a two-stage governor? In his own case the Reynolds governors in use at the high pressure storage stations broke the pressure down from 58 lb. per sq. in. to 42-tenths in one stage. The description of the organization at Tottenham was interesting, particularly in respect of the valve records, which were similar to those in his own Company. They had these many years before the war, and found them most useful during the war. They fixed a false spindle on their valves, firstly to bring the spindles up to within 4 to 6 in. of the ground level, and secondly to reduce the number of keys required to operate them. Thus one key would operate all valves of from 3 to 12-in. diameter, and another those over 12 in. and up to and including 24 in. All their valves closed in an anti-clockwise direction. He confirmed from his experience the necessity for having proper provision for the maintenance and overhaul of governors, valves, pressure recorders, &c. It would be interesting to know if the Tottenham Company used mobile vacuum plants for clearing services and syphons. In that connexion the reference to the Ransome Rapier pump operated by a J.A.P. air-cooled engine was of interest. Most companies found these pumps invaluable for removing water from flooded mains during the war. The South Suburban Company used the same J.A.P. engine for driving the small exhausters which evacuated the syphon tanks and the receivers on their service-clearing outfits.

Testing of H.P. Mains

Mr. **L. F. Masters** (South Metropolitan) said the distribution system in his Com'any did not exceed 1 lb. per sq. in., and he was therefore very interested in the problems recorded in the Paper and the way in which they had been dealt with. He noticed that the long sleeve joint used on the steel main had been superseded, and that all the joints were now either butt welded or sleeve welded, and it would be interesting to know what induced the Company to make the change. Mention had been made of the fact that the 6-in. main from Hitchin had been tested to 100 lb. per sq. in.; he would like to know what was the duration of the test and whether any tolerance was allowed? The main laid from Shefford without falls and with no syphons was also of interest. While he appreciated that with a main laid in that manner there would be a considerable saving on excavation and other work, he felt that at some time during its life some water would get into the main, and he wondered how it would be dealt with.

Mr. **Fuller Peterson** (Bournemouth) said the charts for the calculation of high-pressure losses, &c., should prove extremely useful, and save other people a lot of time in the future. He noticed that when the Author used limit valves on holders the non-return valve was connected with the inlet valve and not direct on to the holder. That was something they had not actually done at Bournemouth. They had considered it safer to connect the non-return valve to the holder to provide against any failure in the boosting plant when the holder was in its top position. An important point that emerged from the Paper was that the war had had one good effect upon gas undertakings in that it had made them keep their records up to date. At Bournemouth the advent of the war, the increase in consumption, and a decrease in calorific value from 450 to 400 B.Th.U. had led them to the stage where, instead of boosting gas to the next station during peak load, they had boosted back, and that corresponded with the Author's suggestion as to the desirability of having compressors working into a main open at both ends. They were taking steps to remedy that state of affairs, but they were actually forced to adopt that procedure at the moment. In connexion with the installation of compressors, he asked whether Mr. Rose found it necessary to install coolers at the outlet of the compressors? Also did he find it necessary or desirable to put in some form of safety seal in case the governor should lock up during the night?

Peak Loads

With regard to peak loads, they at Bournemouth had had opportunities during the last few years of measuring peak loads, and they found that in the average country area, where circumstances were very different from those in the central area, about 10,000 B.Th.U. per hour per consumer was the actual peak, and it occurred around 12.30 on a Sunday, corresponding to about 20 cu.ft. (or 25 cu.ft of 400 B.Th.U. gas). Referring to mechanical excavators, his Company had recently laid about 10¾ miles of main, using a hired excavator. They had since decided to buy one of their own, not because the hiring rate was too high, but because it was deemed desirable to have one.

Mr. **P. Richbell** (Croydon) said Croydon was the most highly bombed district in the London area during the war, and on the question of organization they went a little farther than Tottenham, inasmuch as they segregated the whole of their trunk mains of 10 in. and upwards into three-quarter mile lengths, with valves at vital points, so that on occasions, of bomb damage they were able to shut down damaged lengths and leave the rest of the district intact. That helped them very considerably with their stocks next morning. It would have been useful to have had a plan of the whole of the Tottenham area, which had gone up from 32 to 144 sq. miles, but the illustrations in the Paper only gave them glimpses of the lay-out. Mention had been made of the condensate in the high-pressure mains, and particularly its non-existence in the main laid without syphons. At Croydon they had a main working under 10 lb. per sq. in. pressure. The first part of it was laid without any syphons, and from time to time they had to put on extra pressure to get rid of the liquor. The result was that when it was extended for several further miles it was deemed desirable to insert syphons. With regard to private telephone lines, he asked whether the Author experienced any serious difficulties from interference due to people working on the line, or whether the charts and pressure recorders were seriously affected? He was very interested in the mobile workshop, and had contemplated having something of the kind on his district; he thought it was well worth having.

Cost of Steam

Mr. **L. J. Clarke** (Gas Light and Coke Company) said he would like Mr. Rose to tell them how he obtained his steam at 1s. per 1,000 lb. They had made a lot of steam for many years, and even in pre-war days they found it difficult to make it for much less than twice that figure. Possibly an error arose through taking the overall cost of steam on the works as the figure for any individual project, but that tended to be misleading, because on a works which usually had a combination of waste heat boilers and direct-fired boilers obviously the cost of the waste heat steam brought down the average price. In the case of a new project which necessitated more direct-fired steam, the steam should be charged at the direct-fired rate, which in their experience was more like 2s. to 2s. 6d. per 1,000 lb. Reference had been made to eliminating water at the outlet of the high-pressure boosters by dropping the pressure. That seemed to him to be an extraordinary method of drying the gas, involving as it did quite a substantial proportion of the high pressure they were putting into the system. In connexion with the high-pressure holder at Arlesey, he noted that no pumps were employed. It was a question of mechanics, depending on the size of the system, but it appeared to him that if they depended on keeping pressures up at night time to charge such holders, they were also keeping up the pressure on the mains system to charge a lot of low-pressure holders, such as that at Biggleswade. It also appeared to him that a proportion of the gas going into the Rye Park holder was being unnecessarily compressed, and the pumping costs appeared to be on the high side. Small compressors installed on the high-pressure holder site were usually quite sufficient, and in such cases it was only necessary to re-compress the quantity of gas to be stored in the holder.

Mr. **C. D. Shann** (Gas Light and Coke Company) referred to the installation of two 75,000 cu.ft. compressors at Ponders End, and said he assumed that either one of these was meant to be capable of meeting the peak load on full development. He wondered whether it would not have been better to have had two small compressors of, say, 40,000 cu.ft. each, with a third compressor as a standby. The use of the inexpensive wayleave from Ponders End to Hoddesdon was an interesting departure from practice; had it proved any disadvantage in picking up subsequent intermediate housing development?

Rust Troubles

Mr. **G. G. Warne** (Portsmouth) asked whether, in estimating future demands, the Author had revised his figures, or did they still stand at three times the present demand? Had any of the Connersville boosters been worked to overload; and if so, what was the effect? The Author had referred to choked syphons, but he had not mentioned any rust troubles. He would like to know whether he had any information on that subject, and whether he used dust screens at all? The story of pipe transport was very interesting, but it would have been helpful if they could have had some information as to the transport costs.

Mr. **C. A. Deas** (Tottenham Gas Company) asked whether it would be more economical to put in larger mains and cut the initial pressures down, or to have smaller mains with intermediate boosters. Had Mr. Rose considered the question of putting boosters between Ponders End and Hoddesdon? With regard to steam consumption figures, were they the makers' figures or had they been obtained under test conditions? Commenting on Table I, he pointed out that really the ultimate cost, taking all the different sizes of main, was not very much different, but the slight advantage in favour of larger mains tended to show that there was something in having the larger mains and reducing the pressure.

Mr. **S. A. King** (Tottenham Gas Company) said that while the benefits accruing from the gas from multiple manufacturing stations being fed into one system were obvious from the pressure point of view, there was a disadvantage in having different compositions from each of the works, which might result in more difficulties than the original pressure difficulty.

(*To be continued*)

COMPANY MEETINGS

Gas Light and Coke Company

MR. HENRY WOODALL, M.Inst.C.E., the Deputy Governor, presided at the 239th Ordinary General Meeting of the Gas Light and Coke Company, held on Feb. 21, at 1, Grosvenor Place, London, S.W., in the unavoidable absence through indisposition of the Governor, Mr. A. E. Sylvester, F.C.A., and paid a personal tribute to the memory of the late Sir David Milne-Watson.

He then read the Governor's speech, of which the following is a summary: I should like to begin my address to you by paying a tribute to the late Sir David Milne-Watson. To recount all that he meant to this company and to the Gas Industry generally would take far more time than I have at my disposal this morning, and I can do no more than indicate a few of his more important achievements. I think you all know the history of this Company's expansion while under Sir David's leadership, how it grew from an undertaking covering the City, and Central and East London north of the Thames, and still remains the largest gas company in the world, serving an area of 546 square miles stretching from Windsor to the sea.

But perhaps the most lasting and important memorial to Sir David is in the schemes for social welfare which he initiated within the Company. He was one of the pioneers of social security measures, and employees of the Company have been fortunate in enjoying for many years benefits which are only now to become, on such a scale, generally available when the Government passes its National Insurance Bill.

Introduction of Co-Partnership

The first superannuation fund was established in 1905. In 1909 the co-partnership scheme was introduced, one of the first of its kind in the country. Then there is the Benefit and Hospital Society, which had started in a small way as far back as 1877, and was expanded to provide employees and their families with medical attention, hospital benefit, sick allowances, death benefit, convalescent home facilities, and widows' and orphans' allowances. After the first world war the War Memorial Fund was instituted, which is available to deal with what remains unprovided for by the social schemes I have already mentioned.

Because of the part he played in all these schemes, for the inception of which he had been mainly responsible, and because, also, of his great personal interest in every employee with whom he came into contact, Sir David's name and character inspired an extraordinary loyalty and devotion.

The Directorate

The death of Sir David Milne-Watson and the resignation of Sir Reginald Neville resulted in two vacancies on the Board, and the Directors decided that instead of bringing in anyone from outside they would appoint two members of the staff as Managing Directors—namely, Mr. F. M. Birks, previously chief engineer, and Mr. M. Milne-Watson, previously Commercial Manager, both of whom devote their whole time to the Company.

During the past few weeks we have also lost the services of Sir Harold Hartley, who has joined the board of British Overseas Airways Corporation. Sir Harold had been a director of this company for 23 years, and a deputy Governor since April, 1944.

War-time Tribulations

Before dealing with the accounts I should like to make a few general observations on the war period. When war broke out the Company's economy had for some years been very finely balanced. A steady dividend of £5 12s.% had been paid on the Ordinary shares, and the price of gas had remained constant at just under 9d. per therm. There was unfortunately no cushion in the shape of a substantial carry-forward. As the population streamed out of London the demand for gas went down and reached its lowest level in September, 1940, when it stood at something like 40% below pre-war. This brought about a disastrous state of affairs from the financial point of view, for not only was the reduced business insufficient to meet the overheads of carrying on the business, even though expenses were cut as drastically as possible, but the prices of materials went up by leaps and bounds.

This applied particularly to our main raw material, coal, of which we use something like 3,000,000 tons a year, the cost of which to us has gone up by well over 100%. It must be appreciated, however, that the exodus of population and the resultant decrease in the demand for gas saved the company from a breakdown in supplies, since with no fewer than 8,000 of our employees on active service we could not have met a pre-war demand.

Struggle to Meet Demand

For a time it looked as if the Government would realize that, at any rate to some extent, this shortage of revenue was a national charge and should not fall exclusively on the people of London and our shareholders, but nothing came of this, and we were reluctantly compelled to try to make ends meet by increasing the price of gas by stages to 13.75d. per therm. Later we had to make a further small increase of ¼d. per therm, bringing the price up to 1s. 2d. per therm. I need hardly remind you that we passed our dividend for the December half-year 1940 and the year 1941.

During the last 12 months or so people have been coming back to London and the consumption has steadily risen, until it now stands at very nearly the pre-war figure again. But whilst this is excellent from the point of view of balancing our financial accounts, it has meant that our engineers have had a grim struggle during this winter to produce sufficient gas to meet the demand, and on one or two occasions they have failed. Such a thing never happened in peacetime; however cold the weather the gas was always there. But so long as ample reserves are not available, whether of labour, coal, or plant, gas shortages due to one cause or another may occur. Unfortunately a shortage of gas seems to be very much more serious than a shortage of almost anything else. This, however, may be looked upon as a compliment, since it shows how essential gas is to the life of the community.

Points in the Accounts

I now come to the accounts, and I wish to draw your attention to several outstanding points. We have accumulated a carry-forward of £896,258, which compares with £53,598 at the end of 1938. This carry-forward has been built up almost entirely since the population of London returned, and I shall refer to it again. During the war we have continued each year to provide the estimated sum necessary to maintain and renew our plant, even though it has not been possible to do more than a small proportion of the work. The result of this policy is that we have a balance to the credit of our equalization fund amounting to £2,858,323, against £899,920 in 1938. We are thus in a financial position to proceed as fast as possible with our plans for repairs and renewals without making any abnormal charge to revenue.

The general balance-sheet shows that the amount outstanding in connexion with hire purchase agreements for appliances sold to consumers under these agreements is now £24,358, against £4,192,345 in 1938. This shows very strikingly how we are handicapped from a commercial point of view by the lack of appliances; but we have some hopes that manufacturers, who are actively engaged in switching from munitions production, will be able to increase their at present very small supplies, and so enable us to meet the needs of our consumers. I am afraid, however, that it will be a long time before these needs can be fully met. The general balance-sheet discloses a very strong liquid position, but in view of the expenditure with which we shall be faced in the next few years in regard to both maintenance and renewal of gas-making plant, as well as the purchase of appliances for consumers, I cannot regard this liquid position as being more than adequate.

As I have already pointed out, we have a substantial carry-forward, and the bulk of this is attributable to the year under review. Since our methods of accounting are designed to even out the ups and downs of particular years, as for instance in the case of the equalization fund to which I have referred, this increase in carry-forward means that our revenue is definitely more than is needed to meet our expenditure.

We have to take note of several things in this connexion. First of all the legitimate needs of our employees, for in certain respects the work must be made more congenial so that it attracts the best type of workman; we also have to implement the recent decisions of the National Joint Industrial Council. When this is allowed for, a surplus still remains, and it is not possible to pay more in the way of dividend to the Ordinary shareholders; the 5% we have been paying for a year or two is the maximum we are authorized to pay, and it would not be practical politics to make any effort to revise the basis of authorization.

Price of Gas

We are therefore in a position to make reductions in the price of gas, and this gives us the opportunity of bringing into force a new method of charge, which we believe is fairer to our consumers. We have made a very careful analysis of our costs, and the way they are attributable to various classes of business at various ranges of consumption, and we feel that our first duty is to cheapen the price of gas to those consumers who take a reasonable amount. Hence we hope to introduce a simple block rate, of which the first small block will be at the existing rate and subsequent blocks at lower rates.

In making our plans, moreover, we have naturally considered the position of our slot consumers, who comprise something like 73% of our domestic load and embrace the majority of our poorer customers. Here we have decided that the supplement, which is 2d. per therm in the major part of our area, and which has hitherto been charged on every therm passing through their meters, should be curtailed by charging it on a limited number of therms in each year. A consideration of these facts does, I think, enable us to claim with confidence that our policy is, as it should be, the policy of a public utility service, and that economies or reductions in cost are duly passed on to our consumers.

COMPANY MEETINGS—cont.

"Nationalization and All That"

This brings me naturally to what I might call "Nationalization and All That." Notice has been served on us by the Government that we are to be nationalized, although it has not to my knowledge been suggested by any member of the Government that this is because we have failed in our duty. The Gas Industry is composed as to about two-thirds of statutory companies (with all sorts of restrictions, including the restriction of dividends) and one-third local authorities owning their own gas undertakings. For that reason the British Gas Council has decided that it will not enter the political arena, but must accept the situation. But this, of course, does not mean that any undertakings or any persons engaged in the Industry are precluded from expressing their views.

There are three groups of persons who will be affected by the Government's decision—the proprietors, the men and women engaged in the Industry, and the general public who are the consumers of the products produced by the Industry, and especially of its main product, gas.

Compensation Difficulties

The question of compensation will lead to difficult and protracted negotiations, but, in so far as I am able to intervene in these negotiations, I wish to assure the proprietors of the Company that I shall do my very best in their interests. And in this connexion I would like to point out that in this Company about £1,000,000 of Ordinary stock is held by co-partners. We have in this Industry to-day over 100,000 men and women who depend upon it for their livelihood, and many of them are genuinely troubled as to the effect the new régime will have upon their work and their careers. And that is not all. I have already referred to the pioneer work which this Company has done in the field of social welfare. All this will have to be taken into consideration, and we shall do all we can, if we are given the opportunity, to see that our employees are fairly treated.

As regards our consumers, quite frankly I cannot tell you, nor have I heard anyone even hint at it, how the people of London are to benefit from the nationalization of this company. The answer may simply be that to sweep away this Court of Directors and to substitute some other body composed of better—and more ruthless—men would do the trick. I am far too modest to deny the possibility.

Lamentable State of Uncertainty

But the thing that troubles me most at the present time is the lamentable state of uncertainty that has been created. It seems to me that the worst aspect of the Government's decision is the long gap which must elapse between the announcement of the decision in the broadest possible terms and its implementation, which may not take shape until a year, or even two years, later. This state of uncertainty, if it continues for much longer, will have serious effects upon the Industry itself, and may even bring the experiment to failure.

In conclusion, I would like to say that it is always our endeavour to give the best possible service to the public, but during the war and since, for reasons quite outside our control, we have not been able to maintain the high standard of pre-war days. I am sure you would wish me to thank our many consumers for their forbearance and understanding in the difficult times through which we have passed, and which, unfortunately, are still with us.

The report and accounts were unanimously adopted.

Croydon Gas Company

The one hundred and seventy-fourth ordinary general meeting of the Croydon Gas Company was held at Croydon on Feb. 22.

Mr. **William Cash,** J.P., F.C.A. (Chairman), said: When I had the honour of addressing you a year ago on Feb. 23, 1945, I told you of the regrettable death of our Director, Sir Ernest Bird, on Feb. 6, 1945. I also told you of the coming retirement of Mr. F. F. Wood as Secretary of the Company after 47 years' service with the Company. On Apr. 1 he was asked to fill the vacancy on the Board arising from the death of Sir Ernest Bird. Mr. W. H. Haddleton, Assistant Secretary since 1940, was appointed Secretary, and this appointment has been fully justified.

On Dec. 31 Mr. Walter Grogono, Engineer and General Manager, retired on pension at his desire. Mr. Grogono was appointed Engineer in July, 1927, and on Mr. Sandeman's retirement he was appointed General Manager. His service to the Company is beyond all praise. He has largely reorganized our works and had a very difficult job in the war years. Mr. J. M. Webber, his Deputy, became Chief Engineer, and Mr. D. V. O'Meara, recently Deputy Town Clerk of Croydon, has been appointed General Manager.

I desire to repeat what I said last year as to the services of our officers, staff and workpeople in the war years. Many of you will be well aware of the position of affairs in Croydon. Our work had to be carried out in dangerous conditions, and our A.R.P. personnel never failed us. They attended 935 incidents, involving 297 fractured mains. We suffered two major casualties to our plant. The resident population was largely reduced. Labour was difficult to get. Materials could not be obtained. Our coal supplies were deficient and the quality inferior. We had over 500 of our employees in the Services. I am confident that you will desire to endorse my thanks to all those who have served in the war. Of course, we have assisted in the war effort in many ways, and we shared with other gas undertakings in the thanks of the Minister of Fuel and Power in May, 1945. For instance, we produced 353,745 gall. of toluene of a quality which never failed to comply with the specification laid down by the Ministry of Supply.

Our accounts have this year been sent to the Proprietors after an interval of five years. I do not propose to go through these with you in detail. The corresponding figures for 1944 appear on the accounts. Our sales of gas show an increase in quantity of 8% and £96,800 in money. The price of gas was raised in July to 13.2d. per therm, which price compares favourably with our neighbours. We are proposing to pay the same dividend—*viz.*, 6% on our Sliding Scale Stock—and we add to our carry forward £2,915.

I desire, in addressing the Proprietors, to refer to the question of nationalization. There has been published the Report, dated Nov. 1, 1945, of the Committee appointed by Major Gwilym Lloyd George on June 12, 1944, containing their recommendations and findings. They were requested to advise what changes have now become necessary to develop and cheapen gas supplies. The main recommendation in the Heyworth Report may be briefly stated as a regionalization scheme for 10 regions. This company would fall into the London Region, which embraces 26 companies. In paragraph 232 they say:

"It is not possible to quantify the results likely to be achieved under any one of these headings, or, indeed, to express an opinion as to their overall potentialities. The improvement will certainly not be dramatic, and achievement will necessarily be a matter of some years. The mere formation of larger groupings will not of itself bring about the improvement; it can only provide the opportunity."

This in effect seems to mean that the benefit to the consumer is very remote.

In paragraph 260 they say, on the question of terms:

"The Boards will require compulsory powers to purchase all the existing undertakings. We do not regard ourselves as a competent body to lay down a basis for determining the price. We consider it essential, however, that the terms should be agreed by an impartial body as fair to the existing owners (private or municipal)."

But for you, would that inspire confidence? The following points remain to-day in complete uncertainty: Will the compensation ultimately awarded be handed to our Company to collect and distribute either the Stock or the interest thereon to our Stockholders or handed over to the individual stockholders? What Government Stock will be created and will it be inalienable? How will Debenture Stockholders and Preference Stockholders be treated? What is to become of our Pension Fund and Reserves? How will maintainable revenue be assessed when (*a*) pre-war, (*b*) war, (*c*) post-war profits and rising costs are considered?

Incidentally, in paragraph 227 they do not complain of the Industry, but say:

"In the foregoing Chapters of the Report an attempt has been made to give an outline of the history of the Industry, its present condition, and the factors which are likely to determine its future. Two main points emerge:

"(1) That within the limits of the existing structure the Industry to-day is reasonably efficient, and—

"(2) That the existing structure is restrictive of further progress. In other words, the existing forms of organization no longer suit present-day conditions, and are even less likely to provide the scope to meet the problems of the future."

Somewhat faint praise you may think, but the most extraordinary position is that the Government have not yet stated how far they propose to adopt the findings of the Heyworth Report, and this is not surprising. Having started with a slogan of nationalization, they are now faced with the problem of how to pull to pieces and rebuild a large and complicated industry in the hands of some 800 undertakings, company and municipal, of a rough estimated capital value of £270 millions.

The underlying idea seems to be that private enterprise is out to obtain profits and high dividends regardless of the consumer. The lines on which this Company, with others, has carried on have been very different. Our policy has been to serve the consumer and our whole endeavour is directed to that end, coupled with our Co-Partnership Scheme, and that we have succeeded is proved by the testimonials and letters of thanks which we regularly receive from our customers. In addition, over a period of years, we have carried out a considerable programme of integration. At the same time, the welfare of our employees is our continual care in our Pension Fund, Sick Benefit, Staff Association, Canteens, &c.

It must be remembered that the Gas Industry has been in the past controlled by Parliament with limitations on dividends, reserves and price of gas, and that in the war years the Minister of Fuel has intervened in many directions, and in regard to coal and other materials has directed our operations. The British Gas Council, which is representative of the Industry, is now examining the suggestions in the report and will in due course issue a considered criticism thereof.

I cannot tell you what the answers to these questions may be. But I do suggest to you that this whole proposal is wrong in principle and involves a serious dislocation of a complicated industry, with no advantage to the 10 million consumers whom the Industry now serve, and if you feel as I do, you should not hesitate to express this view whenever the opportunity presents itself.

Portsmouth and Gosport Gas Company

The Annual Ordinary General Meeting of the Portsmouth and Gosport Gas Company was held on Feb. 22 at Portsmouth, Alderman F. E. Beddow (the Chairman) presiding.

The Chairman, after paying a tribute to the late Mr. Thomas Carmichael, and welcoming Sir Denis L. Daley as his successor on the Board and Mr. W. K. Tate as General Manager, said 1945 was a record year in many ways. Sales of gas were more than 10% higher than in the previous year, and constituted a record in the history of the Company. This was all the more remarkable when the destruction by enemy action during the war was recalled, and the result this had in rendering many fewer houses habitable than in 1938. That this output was, of course, in part due to the great shortage of house coal, and, indeed, fuel generally, could not be doubted, but it was evidence of the extent to which the public relied upon gas for warmth and service during these difficult times.

While £21,000 on capital account had been spent on new buildings, plant, mains and meters, the depreciation of various assets amounted to £20,864, with the result that there was only a slight increase in that account. For the second year in succession the total receipts amounted to over one million pounds, and the credit balance of the Revenue Account was almost the same as in 1944—*i.e.*, £93,850 as compared with £95,250, notwithstanding the fact that before arriving at this balance they had made a number of special provisions. They had written off the final balance of the Air Raid Precautions Account of £9,600, set aside a further £5,000 for War Damage Insurance Premiums, increased the depreciation on the Capital Account by over £6,000 as compared with 1944, and had transferred £8,688 to the Renewal Fund Account, increasing it to a total of £30,000.

The price of gas had remained unaltered during 1945, and in view of the fact that in May last the price of coal was increased by 3s. 6d. per ton, and that in September the wages of manual employees were advanced by 1½d. per hour, the balance on the Revenue Account could be regarded with satisfaction. On Profit and Loss Account the dividend payments and interest charges were similar to those for 1944, but two special items have been added. With the passing of the war, their officials had been able to give more thought to taxation matters, and as a result a revised basis of wear and tear over the past six years had been agreed with the Inland Revenue authorities, resulting in the repayment of a sum of £44,596, which had been credited to this account. Furthermore, the taxation charge had been reduced for a similar reason, and it had been found possible to transfer from the Profit and Loss Account £55,000 to a new Deferred Repairs and Renewals Account. The past six years of war, with their inevitable shortages of material and labour, had brought about delays in the normal repairs and replacements at the Company's manufacturing stations, showrooms and offices, and to meet these delayed but none the less necessary charges, the Directors had decided to increase the Renewal Fund to £30,000 and to create this new reserve of £55,000.

Much had been heard about shortage of gas in various parts of the country, necessitating reductions in pressure and involving considerable cooking difficulties for the housewife, particularly at weekends. It reflected great credit upon their employees that at no time had it been necessary for gas pressures to be reduced by the Company. A number of men had returned from the Forces, and many of the women, both young and not so young, who helped so well, had returned to their homes, and they could surely feel that they had played an important part in helping the Company, and their country, to win the war.

The Company's sales policy for the next few years was under consideration, and with the great developments which were contemplated in housing they would use every endeavour to see that a supply of gas was available, without delay, to every householder, whether in a temporary prefabricated house or a permanent dwelling of more substantial type.

Before closing, the Chairman paid tribute to the work of the Secretary and Accountant, Mr. R. W. Hewitt, the Chief Engineer, Mr. E. Allison, and the Sales Manager, Mr. A. J. Garward, who had had to bear the brunt of additional responsibilities brought about by the death of Mr. Carmichael, the late Managing Director.

Mr. W. K. Tate, General Manager, in acknowledging the Chairman's welcome, said that coming, as he had, from another large and progressive gas undertaking, he was delighted, but in no way surprised, to find that the capital assets are in first class order, and he looked forward with confidence to the immediate future, and to the certainty that the Company would continue to give service to all within its area to a constantly improving standard.

The report and accounts were adopted.

In a recent Paper to a joint meeting of the Royal Institution of Chemistry, the Association of Scientific Workers, and the British Association of Chemists at the London School of Tropical Medicine, Mr. Leo Ivanovszky discussed "The Technical Press." Technical publications, he said, should reflect a country's technical skill and resources. Having to act as "living text-books of production," periodicals were responsible for "post-graduate" education and guidance of all categories of workers in industry and trade, and had to perform the vital function of chief sales agents at home and abroad.

Gas Undertakings' Results

Barnet District Gas and Water Company.—Gas sales in 1945 totalled 3,495,910 therms, against 3,386,022 therms in 1944. On the gas revenue account, the balance carried to profit and loss was £25,110, against £31,926. A dividend of 7% on Ordinary stock leaves £24,648 to be carried forward.

Chester United Gas Company.—There was a slight decrease in gas sales during 1945, although receipts at £123,962 showed an increase of £1,157. Receipts from residuals at £70,138 showed a decrease of £2,052. Coke sales were 2,839 tons less than in the previous year, and less crude benzole was made and sold. Total expenditure of £181,948 was £2,870 higher, and total receipts of £205,630 were down by £587, reducing the balance to be carried to profit and loss by £3,457 to £23,681. In 1939 the Company sold 2,474,939 therms, and in 1945 the total was 3,566,591 therms, an increase of 44.1%. A final dividend of 3¼% makes 5¾% for the year, and leaves a carry-forward of £413. In his speech at the 134th annual meeting on Feb. 19, the Chairman, Mr. W. Cullimore, said: "The Gas Industry has not supported and does not support nationalization as an economic principle applicable with advantage to its affairs, but it is willing to co-operate to play its part in securing that nationalization is effected in a form which will not prejudice efficient and economic development and expansion. We do not welcome nationalization, but if it is the will of the people that it shall go through we must do our best to make it work."

Derby Gas Light and Coke Company.—The demand for gas and residual products remained at a high level throughout 1945, and renewals, replacements, and repairs at plant necessary to enable the requirements of consumers to be met continued under the authority of the Ministry of Fuel and Power. The laying of mains to carry gas to new consumers in developing housing areas is being carried out as labour and materials become available. Income from gas sales (13,863,161 therms) was £409,315, against £424,855 for the previous year. The balance carried to profit and loss account was £62,825 against £62,519. A final dividend of 4½% makes a total of 7½% for the year.

Liverpool Gas Company.—Profit for 1945 was £370,578, and gas sales, at 38,584,494 therms, were the highest in the history of the undertaking. A final dividend of 2¾% makes 5½% for the year, and leaves £11,863 to be carried forward, against £49,577 brought in. Further increases in costs necessitated an increase in the price of gas from 10.8 to 11.6 per therm during the year.

Sunderland Gas Company.—The balance carried to net revenue account for 1945 is £18,724, against £19,309 for 1944, and a final dividend of 3% makes 6% for the year, the same as before. The Company made 5,225,627 therms of gas and purchased 4,752,800 therms, and the total gas sales, 9,237,606 therms, an increase of 8.2% over the previous year, yielded £234,885, compared with £213,038. Manufacture and purchase of gas cost £231,310, compared with £203,372 for 1944.

Swansea Gas Light Company.—Income from sales of gas for 1945 amounted to £208,524, compared with £197,098 for the previous year, and residuals brought in £63,476, against £55,190. Of a total revenue of £286,253, a balance of £48,849 was carried to profit and loss account. Final dividends making 5½% for the year on Redeemable Preference stock and 3½% on Ordinary stock have been declared, leaving £16,716 to be carried forward against £14,741 brought in.

Wandsworth and District Gas Company—The accounts are issued this year in a somewhat different form—more in accord with modern practice. Gas sales for 1945 at 34,086,870 therms (£1,965,280) show an increase of 5¾% over those of 1944 and set up a new record for the Company. The balance carried to net revenue account was £366,901, compared with £309,381. After providing for debenture and other interest charges and the payment of interim dividends of 2% on the 4% Preference stock and 2½% on the Consolidated stock, the final dividends are at the same rates, making 4% for the year on the Preference stock and 5% for the year on Consolidated stock, all less tax, leaving £166,559 to be carried forward, against £126,174 brought in. In accordance with the terms of issue, £42,735 of 5½% Leatherhead redeemable debenture stock 1945–55, was redeemed at par on July 1.

Watford and St. Albans Gas Company.—The balance of the revenue account for 1945, after charging depreciation and obsolescence and making provision for war damage insurance, is £85,086, against £90,563 for the previous year. The profit and loss appropriation account shows a balance carried forward of £45,972, against £53,441 brought in, after providing for interim dividends, interest on loan capital, and income tax. Final dividends at standard rates on Preference stock and at 2½% on Ordinary stock, making 5% for the year (the same as for 1944), will absorb £15,454. Gas sales totalled 14,606,015 therms, against 14,682,930 therms, and yielded £671,520 (£656,830). Manufacturing costs at £747,787 showed a reduction of £4,102 compared with 1944.

Weymouth Consumers' Gas Company.—Gas sales in 1945 amounted to 1,630,226 therms, an increase of 81,063 therms, or 5.2% over the previous year. Balance carried to net revenue was £11,798, and Ordinary dividend is at the rate of 5%, the same as for 1944.

The London Market Feb. 25.

There are no changes to report in the prices of Coal Tar products, the majority of which are controlled either by Government Order or by agreements.

The following are controlled by Government Orders at the prices indicated:—

Road tar at 5¼d. per gallon filled into buyers' tanks at sellers' works, with corresponding prices when delivered and when supplied in packages.

The price sprayed direct on to roads is controlled by agreement and is 8½d. per gallon for full tank loads in London and adjacent counties.

Creosote for hydrogenation is based on 5.875d. per gallon and creosote for timber preservation on 5½d. per gallon *ex* sellers' works, with the usual extras for different qualities, packages, &c.

The basic price for cresylic acid is 3s. 6d. to 5s. per gallon, according to grade.

Hot pressed naphthalene costs £11 11s. in bulk *ex* distillers' works. Prices for refined naphthalene vary from £20 15s. per ton for crystal on 50-ton contracts to £26 15s. per ton for ball and flake. These prices are delivered England and Wales in 2-cwt. bags, minimum 4-ton lots.

The maximum prices for coal tar naphtha vary from 1s. 11d. to 2s. 11d. per gallon and for xylol from 3s. 3½d. to 3s. 6d. per gallon delivered buyers' address in minimum 1,000-gallon lots in bulk. The maximum price for pure toluene is 3s. 2¼d. per gallon in bulk *ex* sellers' works.

The following prices are controlled by agreements:—

Pitch for briquetting is 70s. per ton *ex* sellers' works in bulk.

Phenol is 9½d. to 11½d. per lb. in large returnable drums delivered buyers' address, according to quantity.

The Provinces Feb. 25.

The average prices of gas-works products during the week were: Pitch, 70s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6½d. per gallon; pure, 3s. 2¼d. Prices for carbolic acid 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil are controlled by S. R. & O. 1943, 1538, and for naphthalene by S. R. & O. 1944, 1051. Prices for road tar were increased by a half-penny per gallon by S. R. & O. 1945, 229, under which Order there was also an increase of 5s. per ton in the price for standard creosote-pitch mixture.

The bulk of the pitch produced in this country is required for home trade purposes, but certain quantities are being sent at higher prices to Allied countries with the approval of the Coal Tar Control. So far as creosote is concerned the bulk is required for essential purposes, at controlled prices. With regard to hydrocarbon oils, the prices remain fixed, although there is more freedom than was previously the case.

Scotland Feb. 23.

There is still a distinct scarcity of supplies for prompt. Refined tar*: Yield to Distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d. Hydrogenation oil,* 5⅞d.; low gravity or virgin oil,† 7¼d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 7d. to 8d. per gallon. Solvent naphtha*: Basic maximum prices delivered in bulk, 90/160 grade, 2s. 10d., and 90/190 Heavy naphtha, Unrectified, 2s. 0½d.; Rectified, 2s. 4d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

The strength of the gilt-edged market continued the outstanding feature of stock markets last week. Apart from a few specialities among industrials, sentiment was not too cheerful elsewhere, while the Indian disturbances left their mark on Eastern issues.

The Gas market was a little brighter than of late and it will be seen in the list below that more improvements in value were recorded than for some time past. A number of debenture issues were marked up, the feature being a rise of 5 in Commercial 3%, and among ordinaries Imperial Continental closed 4 higher. The following were the price changes up to Thursday last:

SUPPLEMENTARY LIST

Brighton 5 p.c. Deb.	117—122	+2
East Surrey 6 p.c. Cum. Pref. (*x.d.*)	119—124	Feb. 18
Hampton Court Cons. (*x.d.*) ...	105—110	,,
Mid-Southern Utility "A" Cons. (*x.d.*)	105 -110	,,

PROVINCIAL EXCHANGES

Blyth Ord.	122—124	Feb. 18
Bristol 5 p.c. max. (*x.d.*)	113—115	Feb. 11
Hartlepool Ord. (*x.d.*)	91¾—93¾	,,
Newcastle Units	24/3—24/9	+-/6d.
Weston-super-Mare Ord. (*x.d.*) ...	112—114	Feb. 11

OFFICIAL LIST

Alliance & Dublin Ord.	122—127	+2
Associated Gas & Water Ord. ...	20/—21/-	+-/6d.
Ditto Deferred	20/—21/-	+-/6d.
Barnet Ord. (*x.d.*)	155—160	Feb. 18
Bournemouth 4 p.c. Deb.	100—105	+1
British Ord.	115—120	—2
Commercial 3 p.c. Deb.	78—83	+5
Ditto 5 p.c Deb. (*x.d.*)	111—116	Feb. 18
Croydon Sliding Scale (*x.d.*) ...	116—121	,,
Ditto max. div. (*x.d.*)	102—107	,,
Ditto 5 p.c. Deb.	117—122	+2
East Surrey "B" (*x.d.*)	101—106	Feb. 18
Ditto 5 p.c. Deb.	117—122	+2
Gas Light Units (*x.d.*)	21/3—22/3	Feb. 18
Ditto 3½ p.c. max. (*x.d.*)	82—85	,,
Ditto 4 p.c. Pref. (*x.d.*)	98—101	,,
Ditto 4½ p.c. Red. Deb.	104½—107½	+½
Imperial Continental Ord.	109—114	+4
Mid-Southern Utility "C" (*x.d.*) ...	101—106	Feb. 18
Ditto 4 p.c. Pref. (*x.d.*)	97—102	,,
Montevideo	118—123	+1
South Suburban 5 p.c. Deb. ...	117—122	+2
Tottenham 4 p.c. Deb.	100—105	+1
United Kingdom Gas Corporation Ord.	21/—22/-	+-/6d.
Wandsworth Cons. (*x.d.*)	107—112	Feb. 18
Ditto 4 p.c. Pref. (*x.d.*)	99—102	,,
Ditto 5 p.c. Deb.	117—122	+2
Ditto 4 p.c. Deb.	100—105	+2
Watford Ord. (*x.d.*)	108—113	Feb. 18

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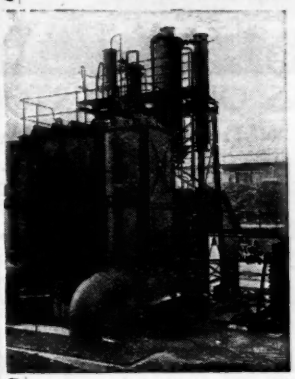

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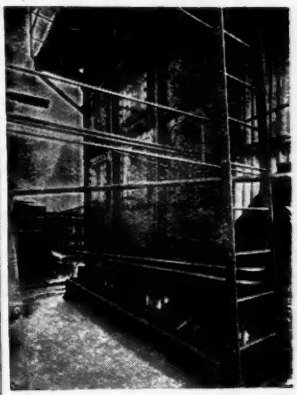

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